

## CLAIMS

1. A surface mount contact for attachment to a circuit board, comprising:  
an elongate electrically conductive pin defining a shaft having a longitudinal axis and having an upper end and a lower end;  
a pre-formed heat re-flowable bonding member attached to the lower end of the pin; and  
an insulator surrounding the shaft of the pin intermediate the upper and lower ends and adjacent the pre-formed heat re-flowable bonding member.

2. The surface mount contact of Claim 1 wherein the pin has a cylindrical cross-section.

3. The surface mount contact of Claim 1 wherein the upper end of the pin is formed with a head with an outer surface that is dimensioned to be positioned on, and bonded to, a conductive pad on a circuit board, and the lower end of the pin is dimensioned and configured to be attached to a lower circuit board.

4. The surface mount contact of Claim 3 wherein the head is formed with at least one channel that opens through an outer surface of the head and a peripheral wall of the head.

5. The surface mount contact of Claim 1 wherein the pin is provided with a shoulder for establishing a predetermined vertical position along the longitudinal axis relative to a reference surface.

6. The surface mount contact of Claim 1 wherein the insulator is a collar.

7. The surface mount contact of Claim 1 wherein the pre-formed heat re-flowable bonding member is a solder ball.

8. The surface mount contact of Claim 7 wherein the insulator has a conductive pad  
formed thereon.

9. The surface mount contact of Claim 1 wherein the insulator is made of a high  
temperature plastic resin.

10. The surface mount contact of Claim 6 wherein the collar is press fit around the  
pin.

11. A circuit board assembly comprising:  
an upper circuit board;  
a plurality of electrically conductive pins each having a shaft with upper and lower ends,  
the upper ends of the pins being attached to the upper circuit board and being arranged in a  
predetermined pattern;  
a plurality of insulators each surrounding the shaft of a corresponding pin;  
a lower circuit board opposing and generally parallel with the upper circuit board, the  
lower circuit board having a plurality of conductive pads arranged in the predetermined pattern;  
and  
a plurality of conductive joints each formed by re-flow of a pre-formed heat re-flowable  
bonding member attached to the lower end of a corresponding pin, each conductive joint bonding  
the lower end of a corresponding pin and a corresponding conductive pad and forming an electro-  
mechanical bond therebetween.

12. The circuit board assembly of Claim 11 wherein the conductive joints are solder  
joints.

13. The circuit board assembly of Claim 12 wherein the upper ends of the pins are  
attached to the upper circuit board by a plurality of second solder joints.

14. The circuit board assembly of Claim 11 wherein the upper ends of the pins are inserted into corresponding holes in the upper circuit board and each pin has a shoulder positioned between the insulator and the upper circuit board that establishes a predetermined longitudinal position of the pin relative to the upper circuit board.

15. The circuit board assembly of Claim 12 wherein each insulator is formed with a second conductive pad that is bonded by a corresponding second solder joint to a corresponding second conductive pad on the upper circuit board.

16. The circuit board assembly of Claim 15 wherein a first melting temperature of the solder in the plurality of second solder joints is above a second melting temperature of the solder in the solder joints that bond the lower ends of the pins to the conductive pads on the lower circuit board.

17. The circuit board assembly of Claim 11 wherein the upper end of each pin is formed with a head with an outer surface that is dimensioned to be positioned on, and bonded to, a second conductive pad on the upper circuit board.

18. The circuit board assembly of Claim 17 wherein the head is formed with at least one channel that opens through the outer surface of the head and a peripheral wall of the head.

19. The circuit board assembly of Claim 11 wherein the pre-formed heat re-flowable bonding member is made of a material selected from the group consisting of Tin/Lead solder, Tin/Bismuth solder, conductive epoxy, brazing compound, welding compound and solder paste.

20. A circuit board assembly comprising:  
a generally planar upper circuit board;

1 a plurality of electrically conductive pins each having a shaft with upper and lower ends,  
4 the upper ends of the pins being attached to plated through holes in the upper circuit board by a  
plurality of first solder joints and being arranged in a predetermined pattern;

6 a plurality of discrete insulators each surrounding the shaft of a corresponding pin;  
a generally planar lower circuit board opposing and generally parallel with the upper circuit  
8 board, the lower circuit board having a plurality of conductive pads arranged in the predetermined  
pattern; and

10 a plurality of second solder joints formed by re-flowing a pre-formed heat re-flowable  
bonding member, each of the second solder joints bonding a lower end of a corresponding pin and  
12 a corresponding conductive pad, a first portion of the pins having lower ends that directly contact  
their corresponding conductive pads and a second portion of the pins having their lower ends  
14 spaced slightly above their corresponding conductive pads.

21. A surface mount contact for attachment to a circuit board, comprising:

2 an elongate electrically conductive pin defining a shaft having a longitudinal axis and having  
an upper end and a lower end;

4 a pre-formed heat re-flowable bonding member attached to the lower end of the pin; and

6 an insulator with a conductive pad formed on an upper surface thereof surrounding the  
shaft of the pin adjacent the pre-formed heat re-flowable bonding member.

22. The contact of Claim 21 wherein the pre-formed heat re-flowable bonding member  
2 is a solder ball.

23. The contact of Claim 21 wherein the upper end of the pin extends above the  
2 conductive pad formed on the upper surface of the insulator.

24. The contact of Claim 21 wherein the upper end of the pin does not extend above  
2 the conductive pad formed on the upper surface of the insulator.

25. The contact of Claim 21 wherein the insulator and conductive pad are formed of

2 Copper clad FR - 4 material.

TOP SECRET